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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/528,954	03/22/2005	Mirko Lehmann	4587-048041	9156

7590 06/04/2007

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EXAMINER	
RAMILLANO, LORE JANET	

ART UNIT	PAPER NUMBER
1743	

MAIL DATE	DELIVERY MODE
06/04/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/528,954	LEHMANN ET AL.	
	Examiner	Art Unit	
	Lore Ramillano	1743	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 April 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *17-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *17-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 March 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4/2/07 has been entered.

Response to Amendment

Status of claims

2. In applicant's reply filed on 4/2/07, applicant amended claims 17 and 27. Claims 17-36 are pending in the application.

Claim Rejections - 35 USC § 112

3. The rejection of claim 20, under 35 U.S.C. 112, second paragraph is withdrawn.

Claim Objections

4. The objection of claim 34 is withdrawn.

Prior art rejections

5. The rejection over the prior art is maintained.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. **Claims 17, 19, 22, 25-27, and 35** are rejected under 35 U.S.C. 102(b) as being anticipated by Saini (US 5439647).

In Fig. 1C, Saini discloses a device (10) comprising: an optical waveguide (i.e. 20) on the surface of which several detection fields (i.e. 24) and multiple radiation receivers are disposed, each detection field including at least one receptor for contact a ligand to form a specific bond a specific bond with the ligand; at least one optical source of radiation, which is a semiconductor radiation source that is integrated into the semiconductor chip (i.e. 14); a semiconductor chip (12) having radiation receivers (16), each detection field having at least one radiation receiver associated therewith: wherein the waveguide is monolithically integrated with the semiconductor substrate or is in the form of a waveguide layer located on the semiconductor chip; and the radiation receiver associated with each detection field is integrated into the semiconductor substrate facing the detection field directly on the backside of the waveguide facing away from the detection field. (column 2, lines 9-34).

In Figs. 1A and 2A, Saini further discloses a device (10) comprising: a semiconductor chip, laterally next to the waveguide, has an electronic circuit (i.e. 99, column 5, lines 28-35); a waveguide connected with the semiconductor chip at least at one bonding point (i.e. by gluing, column 1, lines 30-42); an adhesive coating (or polymer coating, column 1, lines 30-42); and an optical injection system provided in the emission area of the optical radiation source for deflecting optical radiation emitted by the optical radiation source to the waveguide (i.e. 28, 26, column 2, lines 17-34).

In Figs. 3A-3C, Saini discloses a device (58) comprising: an optical waveguide (i.e. 60) on the surface of which several detection fields (i.e. 60 and 30a) are located in which receptors

are directly or indirectly immobilized, wherein when each receptor comes into contact with a ligand the receptor forms a specific bond with the ligand; at least one optical source of radiation, which is a semiconductor radiation source that is integrated into the semiconductor chip (i.e. 68); a semiconductor chip (56) that has at least one radiation receiver (70) on a semiconductor substrate: wherein the waveguide is monolithically integrated with the semiconductor substrate or is in the form of a waveguide layer located on the semiconductor chip; and the radiation receiver associated with each detection field is integrated into the semiconductor substrate facing the detection field directly on the backside of the waveguide facing away from the detection field. (column 3, lines 16-41).

In Figs. 3A-3C, Saini further discloses a device (58) comprising: an optical injection system, which is part of the waveguide and is provided in the emission area of the optical radiation source for deflecting optical radiation emitted by the optical radiation source to the waveguide (i.e. 61, 71, column 3, lines 23-33); and detection fields that are at some distance from one another and are positioned relative to the radiation receivers so each radiation receiver receives essentially no luminescence radiation from a detection field of an other radiation receiver (column 3, lines 23-40).

Additionally, Saini discloses alternative waveguides designed to provide for liquid waveguides, enabling the use of liquid sensing chemistries (flow-through measurement chamber, column 4, lines 55-57).

Claim Rejections - 35 USC § 103

8. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

9. **Claims 18, 20-21, 23-24, 28, and 31-34** are rejected under 35 U.S.C. 103(a) as being unpatentable over Saini in view of Budach et al. ("Budach," US PG Pub. 2002/0135780).

While Saini does comprise a boundary surface, an adhesive coating (i.e. glue that bonds the waveguide to the substrate), and a waveguide that transmits light through the sensor, Saini does not specifically disclose a boundary surface running between two planes, an intermediate layer, and a waveguide made of polystyrene or silicon dioxide or tantalum pentoxide.

Budach disclose an embodiment, which has a boundary surface running between two planes (Fig. 2); an intermediate layer between the semiconductor chip and the waveguide, which has an optical index of refraction, a side of the intermediate layer adjacent the semiconductor chip conforms to a surface of the semiconductor chip, and a side of the intermediate layer adjacent the waveguide is essentially plane (diffraction grooves, Fig. 2, [0109]; and a waveguide, which can be made of polystyrene ([0035]-[0036]) or tantalum pentoxide ([0109]-[0110]).

Saini and Budach are analogous art because they are from the same field of endeavor, which involves antibody chip technology. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify Saini with the limitations of Budach, as stated above, because having the diffraction grooves, which are made of a specific dielectric material and have a particular depth, create an enhanced evanescent resonance condition, which evanescently excites fluorescent material that is on the surface or in the close vicinity of the layer and further causes the amplitude of the evanescent field at resonance position to be significantly greater than that of the prior art arrangements by an order of approximately 100. Moreover, under resonance conditions, when the laser energy is substantially confined to the thickness of the thin dielectric layer, the electrical field strength is increased. ([0111]-[0113]).

10. **Claims 28-30 and 36** are rejected under 35 U.S.C. 103(a) as being unpatentable over Saini in view of Haronian et al. ("Haronian," US 6465241).

While Saini discloses alternative waveguides designed to provide for liquid waveguides, enabling the use of liquid sensing chemistries (flow-through measurement chamber, column 4, lines 55-57), Saini does not specifically disclose an interior cavity of a flow-through measurement chamber and a Peltier element.

In Figs. 1-2, Haronian discloses a device (20) comprising: an optical waveguide (22), wherein receptors are located in an interior cavity (28) of a flow-through measurement chamber that has at least one inlet opening (24), one outlet opening (26), at least one reagent and/or reaction partner for the detection of the bonding of at least one ligand to at least one receptor; and the semiconductor chip defines a wall area of the flow-through measurement chamber (column 5, lines 51 to column 6, line 54). Haronian further discloses utilizing a Peltier element (column 7, lines 53-61).

Saini and Haronian are analogous art because they are from the same field of endeavor, which involves antibody chip technology. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify Saini with the limitations of Haronian, as stated above, because having the flow-through measurement chamber integrated with a chip would provide the monitoring means for monitoring, for example, PCR reactions in an automatable fashion, or preferably in real-time (column 2, lines 17-39). Furthermore, it would be advantageous to include a Peltier element to the device to provide a cooling means to cool the atmosphere surrounding the chip since PCR requires both rapid heating and cooling, i.e. thermal cycling, which would be provided by the reaction and the Peltier element.

Response to Arguments

11. Applicant's arguments filed on 4/2/07 have been fully considered but they are not persuasive.

In response to applicant's argument that Saini does not disclose, teach or suggest an optical waveguide defining a single light path along which multiple detection fields and multiple radiation detectors are disposed, examiner disagrees. Saini discloses in figure 1C, for example, a waveguide sensor comprising an entire waveguide (25) that is made of sensing chemistry, which includes multiple detection fields of bonding between receptors and ligands. Saini's sensing chemistry further reads on applicant's claimed multiple detection fields because applicant recited in claim 17, that each detection field includes at least one receptor. Saini's sensing chemistry, thus, comprises multiple detection fields because it comprises multiple receptors on the sensing chemistry.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., detecting a luminescence radiation produced by one or more ligand/receptor bonds in response to excitation radiation) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lore Ramillano whose telephone number is (571) 272-7420. The examiner can normally be reached on Mon. to Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on (571) 272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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